

SCIENCE

NEW YORK, MARCH 20, 1891.

DRAKE'S REPORT ON THE GEORGIA OYSTER-BEDS.

THE United States Coast and Geodetic Survey has recently published a bulletin (No. 19) containing a report by Ensign J. C. Drake, U.S.N., and assistant United States Coast and Geodetic Survey, on "The Sounds and Estuaries of Georgia with Reference to Oyster-Culture." The author states in his preface that he had but five months for the examination, and but a limited fund at his disposal, and makes no claim for completeness of the work done under those circumstances; nevertheless the results of the examinations appear to have satisfied all the requirements, and the people of Georgia are in possession of the information necessary for wise legislation on the oyster question; and to obtain that was the principal object of the examination.

Mr. Drake reports that he examined all the ground in any way suitable for oyster-growing, the area being some seventy thousand acres. Of this, he finds some thirty thousand acres as suitable for oyster-culture, and some forty thousand acres unsuitable. His decisions in the premises are based upon the character of the bottom and density of the water. He alludes only casually to the number and character of the predatory enemies of the oyster, which is to be regretted; nor does he give much information regarding the oysters found, beyond the fact that they are not "fat," or fit for market, until late in the year. The significant intelligence, however, is that the beds are much depleted from over-fishing.

As the State possesses only some seventeen hundred acres of natural beds, and as these are already much depleted, it is not wonderful that the Legislature desired an investigation, in the first place, and followed it up by passing a liberal law encouraging the cultivation of additional areas; and it is gratifying to learn that under this law some three thousand acres (one-tenth the available area) are already in process of improvement, for, indeed, our oyster-industry is in a sad way, and we must look to the private cultivator for the future supply. Any thing that States can do, investigation accomplish, or enterprise bring about, in this field, will be gladly welcomed by a public which has seen the price of oysters increase from twenty-five cents to fifty cents per bushel in ten years, and the ratio of increase still continuing.

Nearly twenty years ago the Coast Survey began its investigations of the oyster-beds of the country. Count Pourtales was the pioneer. He was followed by Collins and Winslow of the Navy, Bradford of the Survey, and again by Winslow. The United States Fish Commission has added also to the fund of information; and Professors Goode, Ryder, and others have made many valuable reports on the condition of the industry. The Johns Hopkins University has, in connection with the State of Maryland, published the reports and studies of Dr. W. K. Brooks, and no more valuable addition to our knowledge has been made than these reports. The States of Rhode Island, Connecticut, New York, Maryland, and North Carolina have organized commissions and

surveys, and have exhaustively studied the condition of the beds, the fishery, and the general industry of their particular waters.

In the mass of literature that has come into being during the last ten years, it would be naturally expected that some differences should exist as to the condition of the beds and as to the remedy to be applied; but in the main essentials no differences do exist. All the various persons, officials, and bodies, working at different times, in different localities, and without connection, have uniformly reported that the natural oyster-beds were either extinct or fast becoming so, and that the only remedy was to encourage cultivation by private enterprise.

With such unanimity of testimony and advice, it would seem impossible that the remedy should not be applied. Unfortunately such has not been the case. It is true that a few progressive States, such as Connecticut, New York, North Carolina, and Georgia, have started on the right road; but the great oyster areas of the Chesapeake are likely to remain many years uncared for; and, while their beds are being rapidly destroyed, no provision is made to meet the enormous demand which the Chesapeake has heretofore supplied. It is possible that the legislation in North Carolina, which has been in operation several years, may have some effect by encouraging cultivation of the large tract of oyster bottom the State possesses; but, unless such cultivation is now in progress to a very considerable extent, it will not be sufficient to prevent such a falling-off of the supply as to amount to something like an oyster famine in a few years.

It would not be surprising if oysters were soon out of the reach of most people's pockets. If they do become so, we will have the consolation of knowing that we had ample warning, and the gentlemen who have conducted the investigations and made the reports for these many years can have the satisfaction of seeing their prophecies realized. The more reports we have, the better; the more extensive the investigation of the subject, the sooner will a remedy be adopted; and the community has reason to thank the Coast Survey for this last addition to our knowledge, and to congratulate Mr. Drake on his very successful prosecution of a work of so much importance.

HEALTH MATTERS.

Inoculation by Mosquitoes against Yellow-Fever.

DRS. FINLAY and DELGADO of Havana have published some statistics of their practice of inoculating persons newly arrived in Cuba against yellow-fever by means of mosquitoes which have been caused to contaminate themselves by stinging a yellow-fever patient. These observations, according to the *Lancet* of Jan. 31, have been carried on for the last ten years, and, in addition to a certain number which are still incomplete, may be said to consist of fifty-two cases of mosquito inoculation which have been fully followed up. Of these, twelve experienced between the fourth and the twenty-sixth day after inoculation a mild attack of yellow-fever, with or without albuminuria; twelve experienced no symptoms of yellow-fever either within twenty-five days after the inoculation or during three years subsequently; twenty-four experienced no symptoms within twenty-five days, but contracted a mild attack before the end of three years, either uncomplicated by

albuminuria altogether, or with only a very transient appearance of it; three who had had no symptoms within twenty-five days contracted well-marked yellow-fever within three years; one patient who had a mild attack in consequence of inoculation contracted a severe attack later on, which proved fatal: that is to say, of those who had been inoculated, only about eight per cent contracted the disease in a well-marked form, with a mortality of under two per cent. In order to enable one to appreciate the significance of these figures, the authors mention that they observed sixty-five monks who from time to time arrived in Havana, where they all lived under similar conditions. Thirty-three of these were inoculated, and thirty-two were not. Only two of the inoculated contracted well-marked attacks, which, however, did not prove fatal; whereas eleven of those that had not been inoculated were severely attacked, no less than five dying. It is remarked that inoculations performed in the cold weather are not entirely trustworthy, and that they should be followed up by a repetition in the spring.

A New Bleeding Era.

The discussion which took place at the last meeting of the Royal Medical and Chirurgical Society of London was in many respects interesting and noteworthy, says the *British Medical Journal* of Jan. 31, 1891, editorially. Dr. Pye-Smith is to be congratulated on having so effectually succeeded in directing attention to a subject which must always have a real, if even only an historical, interest.

The reflections and conclusions contained in the paper were based upon the record of some fifty cases coming under the notice of the writer, in which venesection had been resorted to. The range of diseases in which it was employed included such acute affections as bronchitis, acute broncho-pneumonia, lobar pneumonia, miliary tuberculosis of the lungs, with others of more chronic nature, such as valvular disease of the heart with pericarditis, Bright's disease, aneurism, and epilepsy. Its value in other conditions, such as hemoptysis, apoplexy, uremic coma, was also considered.

The discussion which ensued was remarkable, on account of the almost complete unanimity which the speakers expressed in favor of the adoption of this method of treatment in suitable and urgent cases. All testified to the great and immediate relief which venesection gave under such circumstances,—a relief unattended by any ill consequences on the subsequent progress of the disease.

Considerable differences of opinion, it is true, existed as to the cases most likely to be benefited by the treatment, or, rather, as to the cases which, in the experience of the various speakers, had most benefited by the treatment; for it was one of the noteworthy features of the discussion that there was a commendable absence of recourse to theoretical considerations as a basis for the practice.

In this respect the subject of venesection occupies a different position from that held by it in the former "bleeding era," to which reference was made in such humorous and instructive fashion by Sir George Humphry and Mr. George Pollock. The practice was then based on the humoral pathology which so long dominated the practice of medicine,—that pathology which ascribes disease to the presence of deleterious agents in the blood, and which seemed, therefore, to justify the withdrawal of a certain quantity of the noxious blood as one of the best ways of curing it. As Dr. Broadbent pointed out, it was because the practice had been based so entirely on theory that it was carried to excess, and fell into such disrepute.

One of the chief merits of Dr. Pye-Smith's paper and of his subsequent remarks was to lay stress on the importance of resorting to venesection; not for the cure of pathological conditions as such, but for the relief of distressing symptoms depending on temporary alterations in the physiological balance of the circulation. As to the first indication laid down for the performance of the operation,—cyanosis with distention of the right side of the heart depending on pulmonary or other obstruction to the circulation,—there was a consensus of opinion favorable to the operation; but Dr. Broadbent did well to point out, that, before resorting to venesection under such circumstances, there should be evidence, as shown by the disparity between the strength of the heart's beat

and the weakness of the pulse, that the right ventricle was still acting powerfully, and able to take advantage of the relief afforded it by the withdrawal of blood.

As to the second indication,—the pain of aortic aneurism,—the cases mentioned by Dr. Pye-Smith and Mr. Hulke, in which instantaneous relief was thus given, were very striking; and evidence of its curative effect on the aneurism was also incidentally adduced by Mr. Jonathan Hutchinson. Nevertheless, as Dr. Stephen Mackenzie pointed out, it may be doubted whether, in iodide of potassium, nitrite of amyl, and nitro-glycerine, we do not possess remedial agents equally powerful and equally efficacious in relieving the high arterial tension on which such attacks of pain depend. The discussion, indeed, brought out the fact that it is in relieving pain that venesection finds one of its best applications, and more especially in relieving the intense inflammatory pain of pleurisy, pleuro-pneumonia, or the severe pain, with threatening onset of cerebral symptoms, following injury to the skull.

To those accustomed, as most now are, to regard loss of blood, from whatever source, as an unmitigated evil, the suggestion to follow up an extensive bleeding from the lungs by a further bleeding from the arm is startling. Nevertheless, something can be said, and was adduced by one of the speakers, in favor of its adoption in cases in which the patient is in urgent danger of suffocation from the reflux of blood into the bronchi. It is, however, peculiarly open to the objection brought against the operation of venesection generally,—that, in the present state of public opinion as to blood-letting, the discredit of a fatal result is too likely to be hastily assigned to the venesection. Apart from such considerations, however, the general result of an unusually animated discussion will be to direct attention once more to the possible advantages attending the judicious employment of a mode of treatment long condemned as not only useless but dangerous.

NOTES AND NEWS.

AN instrument called the "hæmatokrit" has been invented by Herr von Hedin. It is for determining the volume of corpuscles present in blood, and is based on centrifugal action. As described in *Nature*, a volume of blood and one of Möller's liquid (which prevents coagulation) are mixed together, and the mixture is poured into small, thick walled glass tubes, graduated in fifty parts. The tubes rest on a brass holder which is fixed on the axis of a rotation-apparatus. After some eight thousand rotations, in five to seven minutes, the process is complete. The separation between the corpuscles and the salt-plasma is more distinct, in that a narrow band of leucocytes appears between them. The instrument is useful in comparing the blood of different individuals. With a little practice, the total error is not more than one volume per cent.

—Archæologists have, of course, been profoundly interested by the recent discovery of a vault filled with mummies and funereal coffers at Deir Elbahiri, near the plain of Thebes. The Cairo correspondent of the *London Times*, telegraphing on Feb. 24, gives the following as the latest details, according to *Nature* of Feb. 26: "The site of the discovery is east of the Temple of Queen Fatasou, in a small spot previously undisturbed, amidst the excavations made by the late Mariette Bey and Brugsch Pacha. A well-shaft of 15 metres leads to a doorway blocked with large stones, opening on a gallery 73 metres long, whence a staircase descending 5½ metres conducts one to a lower gallery 12 metres in length, both lying north and south. The lower gallery gives access to two mortuary chambers 4 and 2 metres square respectively. At the top of the staircase is a transverse gallery 54 metres long, lying east and west, the object of which is unknown. The total underground area is about 153 metres, excavated in the limestone rock to over 65 feet below the surface. The same disorder reigned amongst the contents of the tombs as was found when the famous royal mummies were discovered nine years ago. Sarcophagi were piled upon sarcophagi, and alongside were boxes, baskets of flowers, statuettes, funereal offerings, and boxes crammed with papyri. There is every indication that the place, though originally constructed as a vast tomb, was chosen for hurried conceal-

ment in time of tumult. Some of the exteriors of the mummy-cases are unusually richly decorated with religious subjects, carefully depicted; others of large size enclose mummies in a broken condition, and were apparently procured hastily, as the spaces for the occupants' names are left unwritten upon. The contents of the papyri are as yet unknown, but hopes are entertained that the writings are of permanent historical interest, and have been thus hidden to avoid destruction. The mummies are priests and priestesses of Ammon, Anubis, Seti, Mentou, and Queen Aahotep, numbering 163, the latest belonging to the twenty-first dynasty. Seventy-five papyri were found in boxes in the form of statuettes of Osiris. Each mummy is also expected to contain more or less valuable manuscripts. The collection is *en route* in barges by the Nile, and will probably reach Cairo in a few days."

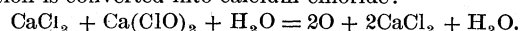
—Mr. G. J. Symons, F.R.S., in a letter to the *London Times*, refers to the remarkable dryness in Great Britain during the month of February as follows: "My observations here have been absolutely continuous for more than thirty years, and hitherto the driest February was that of 1863, when .31 of an inch fell. In 1891 we have less than one-thirtieth of that: we have only .01 of an inch. And if we examine all the other months of the whole thirty-three years, we find that the driest was May, 1885, with .26 of an inch. These two facts sufficiently indicate the exceptional character of the past month at this station. We had one slight sprinkle in the forenoon of Feb. 7, immediately after one of those intense darknesses (arising from high fog) which are becoming so sadly more frequent in this wilderness of chimneys. It had been dark, — actually darker than on a clear moonless night. Fine mist began to fall. I put some sheets of note-paper in the garden for the rain to fall upon. The shower, if such it could be called, was over in an hour, and every drop had left its inky mark upon the paper. I enclose a portion, that you may have one more proof of the need for drastic measures if London is to be clean enough to live in." Mr. Symons has received only one return from England exceeding .10 of an inch, and this was from the hills above Ullswater.

—Professor Seubert contributes an important paper to *Liebig's Annalen*, in which are presented the final results of his redetermination of the atomic weight of osmium. A preliminary account of the earlier portion of this work was published in the *Berichte* in June, 1888, and a short notice concerning it was given in the columns of *Nature* (vol. xxxviii. p. 183). It was then shown that the atomic weight of osmium was certainly not higher than 191, and was probably a few decimals less. Owing, however, to lack of material, Professor Seubert was not able to complete the work in the unimpeachable manner characteristic of his other atomic-weight determinations. Since that time, however, thanks to the kindness of Professor Lothar Meyer, a sufficient quantity of pure osmium has been placed at his disposal, and the work has been completed in a manner which leaves nothing to be desired. The salts analyzed (*Nature*, March 5, 1891) were potassium and ammonium osmium chloride, K_2OsCl_6 and $(NH_4)_2OsCl_6$. The final mean value derived from all the experiments is 190.3, a number which fully justifies the expectations of Professor Seubert that it would fall slightly below 191. The importance of the settlement of this question cannot be overrated, for it removes the last outstanding exception to the periodic generalization. The metals of the platinum group, — osmium, iridium, platinum, and gold, — when arranged in the order of their chemical and physical properties, unmistakably take the relative precedence just quoted. If these properties are, as every one now agrees, periodic functions of atomic weight, the atomic weights of these metals should increase from that of osmium upwards to that of gold. Previous to the year 1878, however, the accepted atomic weights were: gold, 196.2; iridium, 196.7; platinum, 196.7; and osmium, 198.6, — a relation which, if correct, was diametrically opposed to the principle of periodicity. In that year Seubert attacked the subject, and the first outcome of his labors was to correct the atomic weight of iridium, which he found to be 192.5, instead of 196.7. It was a most remarkable tribute to the accuracy of Seubert's work, and likewise of his own, that Joly a short time ago obtained for the

same constant the identical number 192.5. In 1881, Seubert took up the case of platinum, and finally adjusted its atomic weight to 194.3, — a number which was confirmed by a subsequent determination of Halberstadt. In 1887 the position of gold was finally decided by the remarkably agreeing and almost simultaneous determinations of Thorpe and Laurie on the one hand, and Krüss on the other, the value arrived at in both cases being practically 196.7. Finally we have the just completed work of Seubert upon osmium; and the four metals, when arranged in order of atomic weight, now take the order, osmium, 190.3; iridium, 192.5; platinum, 194.3; gold, 196.7, — an order of precedence in full accord with the order of their chemical and physical properties.

—The district in northern Persia where olives flourish, as we learn from the *Journal of the Society of Arts*, London, naturally consists of forty-three villages, which are situated on the confines of the province of Gilân, between Rustemabâd on the north, Manfeel on the south, Tarum on the west, and Rahmetabâd on the east. The British secretary of legation at Teheran says that this group of villages possesses from 80,000 to 100,000 trees, which yield on an average from six to nine pounds of olives per tree per annum, thus giving an annual produce of 560,000 pounds of olives, if the former average be taken. The quantity of good olive-oil derived from the Persian presses may be estimated at 17 per cent of the olives, which would give 127,000 pounds of good oil. The good oil having been extracted, the residue is again pressed, and an oil of inferior quality is produced, which is used in the manufacture of soap. The value of the oil after a good harvest is two *krans* (about 1s. 2d.) per bottle of two pounds weight, at Resht or Teheran, whereas the maximum price paid per bottle after a bad harvest is five *krans*. In obtaining the oil the following process is employed. The olives are gathered late in the autumn, and at once stored in a kind of large bin, where they are left to ferment till the first spring suns; that is to say, till about the festival of the Persian new year, March 21. The olives are then spread out to dry on the flat house-tops. When perfectly dried, they are again packed till they ferment. After this second fermentation, they are trodden by men, somewhat after the fashion in which grapes are trodden in the wine-press. After having been thus trodden, they are boiled, and after boiling crushed in a sort of press between flat stones, a receptacle for the oil being placed beneath the stones. A monopoly for the working and purchase of all the olives in northern Persia was granted to a firm of Russian merchants in a concession given to them by the Shah in 1890; and, in order that no time may be lost in turning a profitable speculation to good account, a member of this firm has, it is said, been already carefully studying the various methods employed in Europe in the pressing and refining of the oil, the method in practice in the olive-oil presses of Marseilles having finally been selected by him. Every olive tree in Persia is subject to a government tax of four *shahis*, or about 1½d. English money.

—Mr. Werner Langguth, writing to *The Engineering and Mining Journal*, states that it may be of interest to some to learn of a comparatively cheap and practical method which will furnish an ample supply of pure oxygen-gas from a solution of chloride of lime (bleaching-powder). The production of this gas and its method were observed and investigated by Mr. Langguth some years ago, and it has since been practically used by him in the laboratory for various purposes. If this method becomes generally known, it may find manifold application owing to its cheapness and simplicity. If a few drops of a solution of a cobalt salt (nitrate of cobalt, $Co(NO_3)_2$, for instance) be added to a strong solution of bleaching-powder in water, $H_2O + CaCl_2 + Ca(ClO)_2$, and shaken well, an evolution of gas will be immediately observed, the production of which will be increased by a slight rise of temperature. The gas thus produced is pure oxygen, free from chlorine, and may be dried, if required, in the usual manner. The evolution is not violent, and the re-action gives an even and continuous flow of oxygen-gas for a long time; that is, until all the bleaching-powder in solution is converted into calcium chloride:



The few drops of nitrate of cobalt added are precipitated by the bleaching-powder to cobalt hydroxide, which suffers no further

change, only producing by its presence the liberation of the oxygen. It is a beautiful illustration of its catalytic action. It is needless to say that the precipitated oxides can be used over again, *ad infinitum*, with the same effect. The calcium-chloride solution is decanted from the settled cobalt hydroxide in the generator, charged with a fresh solution of bleaching-powder, shaken, and the evolution of oxygen commences again. Nickel salts will act on bleaching-powder in the same manner, but the evolution of oxygen is much slower.

— The twelfth annual exhibition of instruments by the Royal Meteorological Society, London, was opened on Tuesday evening, March 3. The exhibition this year was devoted to rain and evaporation gauges, and such new instruments as have been constructed since the last exhibition. Almost every known pattern of rain-gauge that has been used in this country was shown, and it was interesting to compare the old patterns with the new patterns. Most of the gauges had funnels five or eight inches in diameter. The Meteorological Office 8-inch gauge is generally regarded as the best gauge for ordinary observers, to whom cost is not a primary object, as it has all the good features of the Glaisher and of the Snowdon patterns, and, being of copper, is very durable. In mountainous districts, where the rainfall is heavy, and the gauges can only be periodically examined, gauges capable of holding forty or fifty inches of rain must be used. Specimens of these gauges, as well as of the rain and snow gauges used in France, Germany, Russia, Switzerland, and the United States, were shown in the exhibition. Some interesting storm-gauges and self-recording gauges were also exhibited. The evaporation-gauges included several instruments employed for measuring the evaporation from a free surface of water, and others for use with growing plants. A number of new instruments were also exhibited, among which were various anemometers, recording barometers, and cameras for meteorological photography. An interesting collection of maps of rainfall over the British Isles and various parts of the world, as well as numerous photographs of floods, meteorological phenomena, etc., were also on view. The exhibition remained open till Thursday, March 19.

— Bulletin No. 26 (January, 1891) of the Agricultural Experiment Station of the University of Wisconsin, Madison, is on "Sugar-Beet Culture in Wisconsin." This bulletin presents the results of investigations made during the season of 1890 with sugar-beets for the production of sugar. The work has been under the general direction of the Department of Agriculture, Washington, D.C., which also rendered financial aid. In addition to the experiments carried on at the station, experiments were conducted at five sub-stations,—one in each of the following counties; viz., Walworth, Rock, Waukesha, Marquette, St. Croix,—and by seventy farmers in different parts of the State. A summary of the results is as follows: 1. The six varieties of sugar-beets grown contained from 14.81 to 16.76 per cent of sugar in the juice. The co-efficient of purity ranged from 82.2 to 86.3 per cent. About half an acre of each variety was grown, and the yield of washed beets varied with the different varieties from 16 to 26 tons per acre. The estimated yield of sugar varied from 2 to 3½ tons per acre. In a well-managed factory about 80 per cent of this quantity would be recovered as pure granulated sugar. 2. A careful account of the work done in planting and cultivating the plats of sugar-beets grown, showed that it cost from 84 cents to \$1.38 to grow a ton of beets. This does not include the cost of harvesting and delivery, which may be considered as about equal to that of growing the crop. 3. The beet-culture at five sub-stations gave beets whose sugar contents ranged from 12.81 to 17.14 per cent of sugar in the juice, while the beets would have yielded from 4 tons (at the St. Croix County station, where wet cold weather in June caused the beets to rot, and greatly reduced the yield) to nearly 39 tons per acre. The latter heavy yield was estimated from the plats grown at the Waukesha County station. 4. Seventy farmers in 29 counties of the State sent samples of sugar-beets grown by them for analysis. The results of the analyses showed a very wide range, according to the kind of seed used, the manner of growing, skill of the grower, etc. The lowest of all analyses showed 6.48 per cent, and the highest 18.79 per cent, of

sugar in the juice. The latter result was obtained from beets grown near New Holstein, Calumet County, from which locality also other samples were obtained containing a very high percentage of sugar, indicating that this section may prove particularly well adapted to sugar-beet culture. Of other sections that seem well suited to this crop may be mentioned the counties of Keweenaw, Washington, Rock, Jefferson, Waukesha, Milwaukee; in short, the whole eastern and south-eastern portion of Wisconsin. Upon further trial, it is hoped that the western portion of the State may also be found adapted to this plant. There seems no cause in soil or climate to prevent good beets being produced there. 5. Beet associations should be formed, and each member should pledge himself to grow from two to three acres of beets, in order to test the capacity and adaptability of the soil in different localities. Common sugar-beet seed may be used for most of the planting, parts of a few rows being from genuine imported sugar-beet seed. 6. The results of the sugar-beet investigations for the year past are very satisfactory, and encourage the belief that Wisconsin is well adapted to sugar beet culture. The people are urged to continue their interest in the matter, to move forward with caution, and in no case to enter upon the construction of beet-sugar factories until there is positive assurance that the farmers will grow sufficient beets to keep the factory running for the whole working season, and that the soil of the particular locality is adapted to the crop.

— United States Consul Bradley of Nice reports that much of the olive-oil exported from France is adulterated with different seed and nut oils. At least seven or eight of the seed products are so employed. When our fellow-citizens imagine that they are eating their salads with olive-oil, it is possible that at least a portion of the oil eaten is either cotton-seed, ground-nut (*Arachis hypogaea*) sesamum, poppy, camelina, rape, or flaxseed oil. The French farmer and the agricultural stations are doing what they can to remedy this, as growers of the olive are being seriously injured by these cheap mixtures, just as our dairy farmers were hurt by manufactured imitations of butter; but they can do little without the assistance of the buyers. It is quite possible to obtain the pure article now by co-operating with agricultural stations at shipping points, say, Nice, Marseilles, and Bordeaux. At Nice, M. R. Brullé, director of the agricultural station, says, that, if buyers will make it a condition of their orders that samples of the oil to be shipped be placed at the disposal of the consul or director of the station by the oil-merchant for analysis, he will analyze it and pronounce upon its purity, giving a certificate of the same to the merchant shipper. On receipt of the consignment, the buyer, if he wishes, can repeat the examination by a comparatively simple process recently discovered by M. Brullé. If oil has not been sent according to sample furnished, the shipper will be liable to a criminal action. The fear of this would be a strong reason for honesty.

— At a recent meeting of the Ohio State Horticultural Society, and also of the Columbus (Ohio) Horticultural Society, resolutions were passed asking the State Legislature to pass a law compelling owners of plum and cherry trees affected by black knot to destroy the infested branches. In a bulletin just issued by the New Jersey Experiment Station, Professor B. D. Halsted, one of our most eminent economic botanists, urges the passage of such a law in that State, giving the following reasons therefor: "There are some good reasons for legislating against the black knot (*Flow-er-rightia morbosa*) of the plum and cherry trees. In the first place, the fungus is beyond question extremely destructive: whole orchards of large size in many parts of the country have been abandoned because of this parasitic plague. Second, it is a conspicuous disease, and during a half of the year when the trees are defoliated the knots can be found without the least difficulty. Any attempts to shield the trouble, on the part of the owner, would be fruitless, even if he should care to preserve the curse. In the third place, the remedy is the very heroic one of the knife, and easily, safely, and with certainty applied. There may be some compounds put upon the diseased parts that will kill the fungus; but it is so deeply seated, that, when a twig is thoroughly infested, there is little left for the fruit-grower to do but to cut

away and burn the black excrescences. If a tree is badly attacked, the wise method is to cut down bodily, and destroy it by fire. Finally, when once the old knots are cleared out, it will be an easy matter to keep the fungus from gaining a fresh foothold. There are many trees which are literally covered with knots, and have been for years, — trees which bear no fruit, and never will, — and they are worse than mere monuments of carelessness, for they propagate and perpetuate a disease that renders plum-raising almost an impossibility in their neighborhood. Sometimes these old, distorted trees are on the roadside, where any passing lad can pull off and carry to his own home one of these malformations, to become a new centre of infection. But these knots do not need to be transported to produce infection, for the millions of spores developed in the spring, while too small to be seen, pass long distances with the winds, and thus spread the disease. There are several fungous diseases against which the State Legislatures or the National Congress might pass enactments fully as wholesome and beneficial as those for the control of the diseases of animals; but few of them offer so many favorable points for successful legislation as the black knot, — the scourge of plum and cherry growers in many localities. The law should include, to be effective, all wild plum and cherry trees that are breeding-places of the pest."

— Mr. E. H. Hankin of St. John's College, Cambridge, Eng., is said to have discovered a cure for anthrax, to the study of which disease he has devoted himself many years. He based his investigations, according to *Hardwicke's Science-Gossip*, upon the principle of lymph inoculation, which Dr. Koch has so successfully applied in the case of tuberculosis. The glycerine extract in Mr. Hankin's process is precipitated with alcohol, and re-dissolved in water. The experiment has been repeated on a number of subjects with gratifying success. This discovery derives additional interest from the fact that anthrax is not the only disease from which rats (the spleen of which animal produces the protective proteid) enjoy immunity.

— An insect which is not uncommon in India is a medium-sized mantis, between three and four inches in total length. It is one of those mantises, says Mr. J. R. Holt in *Science-Gossip* for March, which have a long slender thorax, and which, owing to the second and third pairs of legs being very long, carry their thorax and head very high. In this insect the thorax is about half its entire length, and is of a bright grass-green color, without any markings, and it obviously mimics a grass-stem. The abdomen is also somewhat slender; the wing-covers are of a grass green color, without markings; and it obviously mimics a grass-blade. But in both these cases the mimicry is obvious, as also the reason for it, and it is not what Mr. Holt would call attention to. The first joint of the fore-legs is widened and flattened; it is also green, and the posterior surface is marked with a large ocellus. When the insect is undisturbed, it remains generally in one place, but is not perfectly motionless: it sways perpetually and uniformly from side to side. In this position it looks very harmless, but if it is startled or alarmed its aspect instantly changes: it partly opens the wings, turns its head and thorax so as to face the terrifying object, makes a noise like a sudden, sharp puff of wind, very like the noise made by a startled snake, and raises its fore-legs so that the first joint lies along the thorax; and, the inside margin of the expansion being nearly straight, it looks as if the fore-legs and thorax were connected. In this position the ocelli are very conspicuous, and, with the small, triangular head and the slender thorax, the effect is to produce a ludicrous resemblance to a diminutive cobra. Now, what puzzles one, is this exact resemblance. The insect could not possibly be taken for a cobra on account of its small size and green color; while, if the object is only to appear formidable, it could have been obtained without imitating a cobra so exactly. It may be suggested that there is no direct imitation, but that the same causes which have led to the development of the eye spots in the cobra have also led to the development of ocelli in this insect, viz., that the apparent possession of a large head gives the animal a more formidable appearance; but this explanation is apparently negatived by the peculiar noise made by the insect, which certainly seems to indicate that a snake is imitated. Possibly the object of

the noise is to suggest that it is some kind of snake, and then the ocelli may suggest that it is one of the cobra kind. Maybe some of our readers may be able to suggest a better explanation. Anyhow, the thing is curious, and worthy of note.

— There is now direct telephone communication between London and Paris. The first conversation between the two cities was exchanged on March 17, and, according to press despatches, the results were highly satisfactory.

— The Illinois Experiment Station is located on a black loam about twenty inches deep, underlaid with clay, — the soil common to the prairies of Illinois. Thus located, that station is wisely devoting much of its resources to the study of the great cereal crop, corn. In Bulletin No. 13, for February, 1891, is given a detailed report of the experiments of corn made at that station for 1890, with a summary of the results for 1888 and 1889. The results may be summarized as follows: Of the varieties of corn treated, the medium maturing sorts (such as Leaming, and white varieties of similar season) are recommended for central Illinois. These have given a higher yield, without exception, than those maturing earlier or later. Good crops of corn were raised from a medium maturing variety when planted any time in May. Planting at about one inch in depth has been followed by larger crops on the average than deeper planting. Corn planted at the rate of one kernel every twelve inches, in rows three feet eight inches apart, gave a larger average yield of grain than when planted either thicker or thinner. Better results were obtained from planting in hills than in drills, apparently because in hill-culture the corn could be kept cleaner. No appreciable benefit has been derived from frequent cultivation, nor from cultivation after the ordinary time. For the three years the yield has been increased to the extent of one-fourth by shallow cultivation. The plat which had no cultivation after planting, except to remove the weeds by scraping with a sharp hoe, yielded more each season than the average of the deep cultivated plats, and in but two instances did any one of the deep cultivated plats yield more than the plat not cultivated. These experiments indicate that any cultivation of the soil which effectually removes the weeds, and at the same time disturbs the roots as little as possible, is the best; and that on this soil the stirring of the ground beyond what is necessary to kill the weeds is of little if any benefit. No practical benefit was received from the use of commercial fertilizers. The increased yields from the use of stable manure probably repaid the cost of the application, and left some profit.

— In a recent bulletin of the Geological Society of America, Robert Bell, M.D., assistant director of the Geological Survey of Canada, describes the nickel and copper deposits of Sudbury district, Canada. There is also an appendix on the silicified glass-breccia of Vermilion River, Sudbury district, by George H. Williams. The town of Sudbury, a creation of the Canadian Pacific Railway, is situated in the backwoods of Ontario, thirty-six miles north of the mouth of French River, on Lake Huron. Other metals, including gold, platinum, tin, lead, silver, zinc, and iron, have been found in the Sudbury district, and probably some of them may prove to exist there in paying quantities. The presence of a considerable proportion of nickel in the ore of the Wallace mine, on the shore of Lake Huron, and in the strike of the Sudbury deposits, was ascertained by Dr. Hunt more than forty years ago; yet the presence of this metal in the latter does not seem to have been suspected for a considerable time after they had been worked for copper alone. The Huronian is notably a copper-bearing system. West of Sudbury, this metal occurs around Batchawana Bay, north of Sault Ste. Marie, at Little Lake George and Echo Lake, at Huron Copper Bay, in Wellington and Bruce mines, on Thessalon and Mississagui Rivers, and elsewhere. To the north-eastward it has been found on both sides of Lake Wahnapiatē, on Temagami and Lady Evelyn Lakes, along Montreal and Blanche Rivers, on the watershed east of the canoe route between Lakes Temiscaming and Abitibi, and finally near the southern extremity of Lake Mistassini. The search for this metal along the Huronian belt is only in its infancy, and the copper-mining industry may some day be very extensively carried on in various parts of this as yet almost unknown section of Canada.

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Communications will be welcomed from any quarter. Abstracts of scientific papers are solicited, and twenty copies of the issue containing such will be mailed the author on request in advance. Rejected manuscripts will be returned to the authors only when the requisite amount of postage accompanies the manuscript. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guaranty of good faith. We do not hold ourselves responsible for any view or opinions expressed in the communications of our correspondents.

Attention is called to the "Wants" column. All are invited to use it in soliciting information or seeking new positions. The name and address of applicants should be given in full, so that answers will go direct to them. The "Exchange" column is likewise open.

MARRIAGE.¹

It always gives me pleasure to respond to the invitation of the members of the Literary Society of Kendall Green, and it will always be my object in addressing you to choose subjects that will be of interest and importance to you in your future lives. You have come together here from every part of the United States to receive in the National College for Deaf-Mutes that higher education which you cannot obtain in the States from which you came.

In a very little while—it may be in one year, or two years, or more—you will separate from one another, and each go back singly to the places from which you came, to begin the battle of life. You will go out into the great world,—the world of hearing and speaking people, a world of people who cannot spell upon their fingers or make signs. Are you prepared for that change, and what is to be your position in that world?

I would have you all remember that you yourselves are a part of that great world of hearing and speaking people. You are not a race distinct and apart, and you must fulfil the duties of life, and make your way to honorable positions among hearing and speaking people.

Now, I have considered what subject I could bring to your attention to-night the consideration of which would be of assistance to you when you go out into the world; and there is no subject, I am sure, that lies closer to your hearts than the subject of marriage.

It is a very difficult thing for me to speak to you upon that subject, because I know that an idea has gone forth, and is very generally believed in by the deaf of this country, that I want to prevent you from marrying as you choose, and that I have tried to pass a law to interfere with your marriages. But, my friends, it is not true. I have never done such a thing, nor do I intend to; and before I speak upon this subject I want you distinctly to understand that I have no intention of interfering with your liberty of marriage. You can marry whom you choose, and I hope you will be happy. It is not for me to blame you for marrying to suit yourselves; for you all know that I myself, the son of a deaf mother, have married a deaf wife.

I think, however, that it is the duty of every good man and every good woman to remember that children follow marriage, and I am sure that there is no one among the deaf who desires to have his affliction handed down to his chil-

dren. You all know that I have devoted considerable study and thought to the subject of the inheritance of deafness, and if you will put away prejudice out of your minds, and take up my researches relating to the deaf, you will find something that may be of value to you all.

We all know that some of the deaf have deaf children,—not all, not even the majority, but some,—a comparatively small number. In the vast majority of cases there are no deaf offspring, but in the remaining cases the proportion of offspring born deaf is very large,—so large as to cause alarm to thoughtful minds. Will it not be of interest and importance to you to find out why these few have deaf offspring? It may not be of much importance to you to inquire whether by and by, in a hundred years or so, we may have a deaf variety of the human race. That is a matter of great interest to scientific men, but not of special value to you. What you want to know, and what you are interested in, is this: are you yourself liable to have deaf offspring? Now, one value in my researches that you will find is this: that you can gain information that may assure you that you may increase your liability to have deaf offspring or diminish it, according to the way in which you marry.

The Rev. W. W. Turner of Hartford was the first, I think, who showed that those who are born deaf have a greater liability to have deaf offspring than those who are not. He showed, that, where a person born deaf marries another person born deaf, in this case about one-third of the children are deaf. Mr. Job Williams, the present principal of the Hartford Institution, has still more recently examined the subject; and, in a letter published in *Science* a short time ago, he arrives at the same conclusion,—about one-third are born deaf. In 1888, Mr. Connor, the principal of the Georgia Institution, made an examination of the results of the marriages of his pupils, and his statistics are published in "Facts and Opinions relating to the Deaf." He also comes to the same conclusion,—about one-third are born deaf.

The following table will show you the exact figures:—

TABLE I.—Concerning the Offspring of Couples Both of Whom were born Deaf.

Authority. ¹	Total Number of Families.	Total Number of Children.	Number of Deaf Children.	Percentage of Children Who are Deaf.	Number of Deaf Children to every 100 Families.
Turner (1868).....	24	57	17	29.8	70.8
Connor (1888).....	16	59	19	32.4	118.7
Williams (1891).....	52	151	48	31.8	92.3

It is obvious that persons born deaf run considerable risk of having deaf offspring if they marry persons who are also born deaf.

If we take all the marriages of congenitally deaf persons, without reference to whether they married deaf or hearing persons, we have five independent sets of statistics from which we may derive information regarding the effects upon the offspring. (1) My own researches indicate that where

¹ For Rev. W. W. Turner's results, see my Memoir, p. 20. For Mr. Connor's results, see Facts and Opinions relating to the Deaf, p. 61. For Mr. Job Williams's figures, see *Science*, vol. xvii. p. 76, published Feb. 6, 1891. Dr. Gillett, in *Science* (vol. xvii. p. 59, Jan. 30, 1891), says there were thirteen couples in the Illinois Institution in which both parties were born deaf. One of these couples had two hearing children and one deaf child. He does not state how many children were born to the other twelve couples, but says they could all hear.

¹ An address delivered to the members of the Literary Society of Kendall Green, Washington, D.C., March 6, 1891, by Alexander Graham Bell.

one or both of the parties were born deaf there will be fifteen deaf children in every hundred families; (2) Dr. Gillett's statistics give eighteen deaf children to every hundred families; (3) Dr. Turner's, thirty-two; (4) Mr. Williams's, forty-seven; and (5) Mr. Connor's, ninety-five.

TABLE II. — *Concerning the Offspring of Couples One or Both of Whom were born Deaf.*

Authority. ¹	Total Number of Families.	Total Number of Deaf Children.	Percentage. (Number of Deaf Children to every 100 Families.)
Turner (1868).....	190	61	32.1
Bell (1883).....	360	56	15.5
Connor (1888).....	22	21	95.4
Gillett (1891).....	71	13	18.3
Williams (1891).....	211	101	47.8

Persons who are reported deaf from birth, as a class, exhibit a tendency to transmit the defect; and yet when we come to individual cases we cannot decide with absolute certainty that any one was born deaf. Some who are reported deaf from birth probably lost hearing in infancy; others reported deaf in infancy were probably born deaf. For educational purposes the distinction may be immaterial, but in the study of inheritance it makes all the difference in the world whether the deafness occurred before or after birth. Now, in my researches I think I have found a surer and more safe guide to those cases that are liable to transmit the defect.

The new guide that I would give you is this: look at the family rather than at the individual. You will find in certain families that one child is deaf and all the rest hearing, the ancestors and other relatives also being free from deafness. This is what is known as a "sporadic" case of deafness, — deafness which afflicts one only in a family.

Well, the deafness in such cases may be accidental. There is no proof that such deafness is liable to be inherited, excepting where the person is reported deaf from birth. In the vast majority of cases reported deaf from birth there is an undoubted tendency to inheritance; but where the deafness is caused by meningitis, scarlet-fever, or like causes, and no other case of deafness exists in the family, there is probably little, if any, tendency to inheritance. But when you have two members of one family deaf, or three, or four, or five, there you have the proof that a tendency to deafness exists in the family. What I term "family deafness" exists there. Something has been transmitted from the parents to the children that has caused deafness, or helped to cause it. I remember a case in which there were four children in one family deaf, and none of them were born deaf. One child became deaf, perhaps, from measles, another from scarlet-fever, etc. I do not now remember exactly what causes were stated. They became deaf, however, at different times, and from apparently accidental causes. But can we consider that it was accidental that there should have been four children in one family deaf? The fact that a number of children in the same family are deaf points to an inherited tendency to deafness in the family. One result of my researches is to show the great importance of studying the results of marriages of persons who come from families of

that kind. My results, however, until verified by other observers, should be received as probable only, and not certainly proved.

So far as I can find out, the hereditary character of the defect in a family is roughly indicated by the proportion of the family who are deaf. If you make a fraction, and place the number of deaf children above as the numerator, and the total number of children below as the denominator, for example, $\frac{1}{6}$, that fraction will give you some idea of the tendency to deafness in that family: one child in six is deaf. Again, take a case in which three out of six are deaf ($\frac{3}{6}$). Now, the tendency to transmit deafness in this family ($\frac{3}{6}$) will be greater than in that ($\frac{1}{6}$). Every member of the first family ($\frac{3}{6}$), whether deaf or hearing, will have a greater tendency to have deaf children than the members of the other ($\frac{1}{6}$). In general, the tendency to transmit deafness is greatest in those families that have the largest proportion of deaf members, and smallest in those that have the least. This conclusion is exceedingly probable, and should therefore be taken as a guide by those who desire to avoid the production of deaf offspring. If you marry a hearing person who has three or four deaf brothers and sisters, the probability of your having deaf children will be greater than if you marry a deaf person (not born deaf) who has no deaf relatives.

The statistics collated by me ("Memoir," p. 25) indicate that 816 marriages of deaf-mutes produce 82 deaf children: in other words, every 100 marriages are productive of 10 deaf children. That is a result independent of the cause of deafness, — an average of all cases considered. Eliminating 40 cases where the cause of deafness is not given, I divide the remaining 776 cases into 4 classes: —

Class 1. Persons not born deaf who have no deaf relatives.

Class 2. Persons not born deaf who have deaf relatives.

Class 3. Persons born deaf who have no deaf relatives.

Class 4. Persons born deaf who have deaf relatives.

TABLE III.

	Number of Families.	Number of Deaf Children.	Percentage. (Number of Deaf Children to every 100 Families.)
Class 1. Not born deaf, no deaf relatives..	363	17	4.7
Class 2. Not born deaf, deaf relatives.....	53	5	9.4
Class 3. Born deaf, no deaf relatives.....	130	15	11.5
Class 4. Born deaf, deaf relatives.....	230	41	17.8

The percentage results are shown by themselves in the following table (Table IV.), in which the figures indicate the number of deaf children produced by every 100 marriages of persons belonging to Classes 1, 2, 3, and 4.

TABLE IV.

PERIOD OF LIFE WHEN DEAFNESS OCCURRED.	CHARACTER OF THE DEAFNESS.	
	Sporadic Deafness.	Family Deafness.
After birth.	4.7	9.4
Birth.	11.5	17.8

My statistics are confessedly very imperfect, and many persons have hastily concluded that the results are therefore

¹ References as for Table I. For my own results, see Memoir, p. 25.

of no value or significance. This, however, is not the case; for the imperfection of the statistics assures us that the figures given are all underestimates, the true number of deaf children in every case being greater than that mentioned. As a matter of fact, all the statistics since collected by others have shown larger percentages.

While it is believed that the true percentages are larger than those given, it is probable that they are proportionately larger; so that we may conclude with probable accuracy that persons belonging to Class 4 are more liable to have deaf children than those belonging to Class 3, those of Class 3 more liable than those of Class 2, and those belonging to Class 1 are the least liable of any, to have deaf offspring. The relative liabilities are probably represented by the percentage figures.

The results are imperfect from another cause. The institution reports from which the statistics were compiled did not give details concerning both the parties to a marriage.

It would be stated that Mr. So-and-so "married a deaf-mute;" but no information would be given as to whether his wife was born deaf or not, or whether she had or had not deaf relatives. I have only been able, therefore, to classify the marriages by one side. For example: the results noted for Class 1 give the summation of all marriages of persons not born deaf who have no deaf relatives, quite regardless of the fact that some of them married congenital deaf-mutes, others semi-mutes, and still others hearing persons. We may deduce, however, from the figures, that, if the husband belongs to Class 1, his liability to have deaf offspring will be greatest if his wife belongs to Class 4, and least if she belongs to Class 1, etc.

Now that Professor Fay has taken up the subject, I hope that we may obtain statistics of greater accuracy and importance than any yet compiled.

When we obtain statistics classified by both parties to the marriage, I think it will be found, that, where persons belonging to Class 1 marry persons also belonging to Class 1, there will be no deaf offspring, or, at least, that the percentage of deaf offspring will be insignificant; for surely accidental deafness is no more liable to be inherited than the accidental loss of an arm in battle, for instance. If, however, a person born without an arm should marry a person also born without an arm, some of the children would probably exhibit the same defect. In a similar manner, persons belonging to Classes 2, 3, and 4 exhibit a decided tendency to transmit deafness to their offspring.

Now, there is a law of heredity that may afford great comfort to many of the deaf, — the law of reversion. There is a very strong tendency in offspring to revert to the normal type of the race. It requires constant selection from generation to generation on both sides to perpetuate any abnormal peculiarity. There will always, therefore, be a tendency to produce hearing children rather than deaf, excepting in cases where both parties to a marriage come from families belonging to Classes 2, 3, and 4.

Probabilities for Your Guidance.

Whatever may be the character of the deafness in your own case, you will probably diminish your liability to have deaf offspring (1) by marrying a hearing person in whose family there is no deafness; (2) by marrying a deaf person (not born deaf) who has no deaf relatives (Class 1), or a hearing brother or sister of such a person.

On the other hand, you will probably increase your liability to have deaf offspring (1) by marrying a deaf person (not

born deaf) who has deaf relatives (Class 2), or a hearing brother or sister of such a person; (2) by marrying a deaf person (born deaf) who has no deaf relatives (Class 3), or a hearing brother or sister of such a person; (3) by marrying a deaf person (born deaf) who has deaf relatives (Class 4), or a hearing brother or sister of such a person.

Of course, if you yourself were born deaf, or have deaf relatives, it is perfectly possible that in any event some of your children may be deaf. Still, I am inclined to think, that, if you marry a member of a family in which there is no deafness (or only a single case of non-congenital deafness), you will not only have fewer deaf children than if you married into a family containing a congenital deaf-mute, or a number of deaf persons, but the deafness of your children will not tend so strongly to be handed down to the grandchildren. The tendency to inheritance will be weakened in the one case, and intensified in the other: that is, in the former case your deaf child will have a less tendency to transmit his defect to his children than you yourself possess; in the latter case, a greater tendency.

Take the case of a family in which three or four children are born deaf.

Now, suppose that all the members of this family and their deaf descendants are careful to marry only into families which are free from deafness, or which contain only single cases of non-congenital deafness. Then the probabilities are that at each generation the percentage of children born deaf will be less, and the proportion of hearing children greater, until finally the deaf tendency disappears, and all the descendants will hear.

On the other hand, suppose that the members of this family and their deaf descendants marry into families containing a congenital deaf-mute, or containing several deaf persons. Then the probabilities are that at each generation the percentage of children born deaf will increase, and the proportion of hearing children will be less, until finally the tendency to produce hearing offspring disappears, and all the descendants will be deaf. This family would then constitute a deaf variety of the race, in which deaf offspring would be the rule, and hearing offspring the exception.

Now, the point that I would impress upon you all is the significance of family deafness. I would have you remember that all the members of a family in which there are a number of deaf-mutes have a liability to produce deaf offspring, the hearing members of the family as well as the deaf members.

This, I think, is the explanation of the curious fact that the congenitally deaf pupils of the Hartford Institution who married hearing persons had a larger percentage of deaf children than those who married deaf-mutes. It is probable that many of the hearing persons they married had brothers or sisters who were born deaf.

Cases will constantly arise in which a proposed marriage will appear undesirable and desirable both at the same time. For example: a semi-mute having no deaf relatives may form an attachment for a congenitally deaf person in whose family deafness may be hereditary. Of course, I have nothing to say as to what the young people should do: that is a matter for them to decide. I cannot even undertake to advise. The semi-mute will have no tendency to have deaf children if he or she will marry a person of similar kind (Class 1), or marry a hearing person belonging to a family in which there is no deafness: hence this person, by marrying a congenitally deaf person in whose family deafness is hereditary, will create a liability to have deaf offspring which would not

otherwise exist. From this point of view, the marriage is undesirable.

On the other hand, from the point of view of the person born deaf, such a marriage is extremely desirable, for it will diminish the hereditary tendency in his family. In such a case, the friends of one party would probably favor the union, and the friends of the other advise against it; and the mutual friends of both could only say, "It is desirable to one, and undesirable to the other: we cannot advise; your own hearts must decide the matter."

Now, I have come before you to-night to show you that there may be something in my researches of benefit to you; I want also to assure you that there is nothing of harm. I want to disabuse your minds entirely of the idea that I intend or desire to interfere with your perfect liberty of choice. I claim the right to advise you as I would advise my own children, or any young people in whom I feel an interest. In this matter my views coincide very closely with those recently expressed by President Gallaudet through the columns of *Science*. You have to live in a world of hearing and speaking people, and every thing that will help you to mingle with hearing and speaking people will promote your welfare and happiness. A hearing partner will wed you to the hearing world, and be of inestimable value to you in all the relations of life. Not only will your own success in life be thereby increased, but the welfare of your children will be materially promoted. It is surely to the interests of children, both deaf and hearing, that one at least of their parents should hear.

I would therefore hold before you as the ideal marriage a marriage with a hearing person. Do not let any one place in your minds the idea that such a marriage cannot be a happy one. Do not let any one make you believe that you cannot find a hearing person who will treat you as an equal. The chances are infinitely more in your favor that out of the millions of hearing persons in this country you may be able to find one with whom you may be happy than that you should find one among the smaller numbers of the deaf.

I think the sentiment is hurtful that makes you believe you can only be happy with a deaf companion. That is a mistake, and, I believe, a grave one. I would have you believe that the welfare of yourself and your children will be greatly promoted by marriage with a hearing partner, if you can find one with whom you can be happy.

And now, my friends, I must thank you very much for the attentive way in which you have listened to me, and I hope that you will all dispel from your minds any idea that I intend to interfere with your liberty of marriage. I know that very grave misconceptions of my position and views have been circulated during the past few years among the deaf. I have before me to-night an audience composed of the brightest and most intelligent minds among the deaf, and I want you to help me in dispelling these ideas.

These misconceptions have arisen chiefly, I think, from too great reliance upon newspaper stories and second-hand information. The newspapers seem to know a good deal more about my opinions and views than I do myself, and I am constantly seeing items about myself that have utterly no basis in fact. Only a few weeks ago I read in a newspaper a long report of an interview with me that never took place. The substance of that article has since been copied from paper to paper all over the United States. I happened to be suffering from a slight headache when the reporter called at my hotel, and I thought this would afford a good excuse for avoiding an interview. I therefore sent my com-

pliments to the reporter, and begged to be excused. He went away, and I thought that that was the end of the matter. Alas, no! Next morning I found myself in the paper, in large capitals, giving forth opinions relating to the education of the deaf that I had never expressed.

Now, I would impress upon your minds the fact that if you want to do a man justice, you should believe what a man says himself rather than what people say he says. There is no man in America, I think, who has been more interviewed by newspaper reporters than I have, and I can assure you that I have never yet seen a report of an interview with me that was free from error.

But now I begin to be afraid of you; for you are the interviewers in this case, and I wonder how I shall be reported by you in the newspapers of the deaf. I am talking to you by word of mouth, while my friend, Professor Fay, is translating what I say into the sign-language. Then by and by you will translate it all back again into English for the benefit of your deaf friends in distant parts. You are the interviewers this time, and I fear you are just as liable to make errors of statement as the ordinary newspaper reporter. I have therefore brought with me to-night a gentleman who has taken a stenographic account of all that I am saying to you. I will look over his notes and correct them, and then it will afford me pleasure to present every member of the Literary Society with a printed copy of my remarks. Allow me, therefore, to request the correspondents of distant papers kindly to reserve their notes of my remarks until they can get my own words in black and white.

I must thank you very much for the attention with which you have listened to me, and in conclusion I would simply say, that, if any one here desires to ask me questions upon the subject of my address, I shall be happy to do my best to reply.

BRITISH NEW GUINEA.

MR. J. P. THOMSON read a paper in December last, on "The North-east Coast of British New Guinea, and some of the Adjacent Islands," before the Queensland Branch of the Royal Geographical Society of Australasia, an abstract of which appears in *The Scottish Geographical Magazine* for March. He remarked on the absence of information regarding this coast before the establishment of the British authority in New Guinea, which he accounted for by the fact that this part is less accessible from Australian ports than the south-eastern coast. The mountain-ranges, when viewed from a distance, seemed to rise abruptly from the shore, leaving no margin of cultivable land, and the natives bore the reputation of barbarous cannibals. Moreover, the indentations of the coast, such as Goodenough, Collingwood, Dyke Acland, and Holincote Bays, are too exposed to afford safe anchorage for ships in stormy weather. Sir William Macgregor, therefore, could not fail to bring back a large fund of information from his expedition to this coast in July, 1890.

The Anglo-German boundary is defined on the coast by Mitre Rock, a mass of conglomerate rising upon, or near to, the 8th parallel of south latitude, to a height of 60 feet above the water, with an opening about 12 feet high and 1 yard broad extending through it from north to south. Within a quarter of a mile of this rock, Boundary Cape, so named by Sir Peter Scratchley, projects into the sea, a promontory of low forest-clad hills rising to a height of 400 to 500 feet. No natives were discovered until the expedition had advanced as far south as Caution Point, where a large village on the coast is inhabited by a powerful tribe. The men ornament their chins with false beards extending from ear to ear, and decorate their heads with cassowary feathers, shells, and fibres; but tattooing seems not to be in fashion among them. The largest tribe met with inhabits a district of hilly ground and sago swamps lying to the south of Boundary Cape, behind which

undulating country extends up to the ridges of the Owen Stanley Range. They are unacquainted with the use of iron, and, though friendly disposed towards white men, could not be persuaded to exchange their spears, adzes of jade and basalt, etc., for hardware or other articles.

The border of Dyke Acland Bay is occupied by a group of villages to which Sir W. Macgregor gave the name of Oro; but, as it was derived simply from the words used by the local guide on approaching the shore, there is some doubt whether it is a tribal name or not. These villages are situated amidst the forest and grassland sloping down from the Hydrographer's Range, the spurs of which are inhabited by a population of about 3,000. At the eastern extremity of Dyke Acland Bay lies Cape Nelson, remarkable for its numerous indentations, some of which, such as Maclaren Harbor and Port Hennessy, so named by Sir W. Macgregor, are excellent havens of refuge for shipping. Within the perimeter of this cape lie two mountains, — Mount Trafalgar, rising to a height of some 4,000 feet; and, to the south of it, Mount Victory, probably 3,500 feet high. The latter is an active volcano; for in the early morning steam was observed rising from its two crests, and from a ridge at a lower elevation, and, as the day advanced, the whole top of the mountain became obscured by dense exhalations. Whereas Mount Trafalgar is clothed to its summit with forest, the volcano is precipitous, and crowned with masses of bare rock. Another large inlet, Collingwood Bay, lies between Cape Nelson and the next promontory, which terminates in the two headlands, Kibirisi Point and Cape Sebiribiri (or Vogel).

On the western shore dwells the Maisina tribe, in villages of inferior construction. The houses hold only one family each, and their roofs project to about three feet from the ground, thus forming verandas. These natives also are unacquainted with iron and tobacco, and adorn themselves with the usual ornaments of feathers, shells, and dog's teeth. The country towards the interior is low, and densely covered with forests, in which the *casuarina* is conspicuous. Several villages stud the coast between Kibirisi Point and Cape Sebiribiri; and opposite one of them, named Kapikapi, rise two singular masses of coral, probably eighty feet high, on each of which stand about a dozen houses. These, being stocked with spears and approached by wooden ladders, removable when necessary, are probably used as strongholds.

After Cape Sebiribiri, Goodenough Bay is reached, stretching to East Cape on Ansell's Peninsula, — a district that has gained a sad notoriety from the murder of Capt. Ansell and the destruction of the "Star of Peace" in 1888. The head of the bay is interesting from the miniature plateaus, elevated about 300 feet above the sea-level, of which the land is composed, and which have been formed by the soil washed down from the ravines in the background. The climate of this part of New Guinea is probably healthy; but the absence of navigable rivers would prove a great obstacle to the cultivation of suitable lands in the interior, if such should be found.

Sir W. Macgregor also visited the Trobriand, Murua (Woodlark), and Nada (Lauchlan) Islands, situated far away to the north and north-east of East Cape, between the parallels of 8° 25' and 9° 23' south latitude, and the meridians of 150° 30' and 153° 40' east longitude. Nada is a group of islets, about nine in number, forming an atoll, with a lagoon seven to twelve fathoms deep, and is inhabited by 169 natives. Murua, to the west of Nada, is about thirty-eight miles long, and possesses a good harbor. The natives have entered the iron age, and have abundance of food, consisting of yams, *taro*, and sweet-potatoes. The Trobriand Islands lie to the north-west of Murua. The whole group is of coral formation, and is densely covered with forest, and the fertility of the soil is indicated by the abundance of cultivated food. The natives also catch large quantities of fish. They were very friendly with Sir W. Macgregor's party, and very eager to trade. These islands are so much more important in extent and population than had been reported, that several weeks might be spent in thoroughly exploring them.

WALTER DAMROSCH has set Lord Tennyson's poem to music in last week's *Truth*.

BOOK-REVIEWS.

Primitive Folk-Studies in Comparative Ethnology. By ELIE RECLUS. New York, Scribner & Welford. 8°. \$1.25.

Few writers on science, and none on geography, command a more attractive style than Reclus. His vast reading supplies him with a wonderful wealth of analogy; he is never dull; and his philosophizing, which he is not shy to offer, is fresh and progressive.

In the volume before us he undertakes a study of the sociology of half a dozen "primitive" or savage nations, the avowed object being to furnish from them a picture of the condition of man in general in prehistoric ages. Of these half-dozen nations, two are selected from America, — the Eskimos or Inuits, and the Apaches, — while the other examples are from India, as the Nairs, the Kolarians of Bengal, and the tribes of the Neilgherry Hills.

The ethnography of the American portion leaves considerable to be desired. The author includes in the Eskimos the Chukchis (Tchouktches) of Siberia and the Koloschs of the North-West Coast, neither of whom are in any way related to the Inuit. He further speaks of the Kolosches as distinct from the Tlinkits, though these are merely two names for the same people. In enumerating the Apache tribes (p. 123) he confuses them with the Yumas, who belong to a wholly different stock, and again with the Pah-utes (p. 140), who are distinct from both. These unfortunate errors throw a shade of inaccuracy over his descriptions, because, though correct in themselves, they do not always apply to the peoples whom he sets out to depict.

His authorities are usually carefully selected, and his quotations highly illustrative. A tendency to force into prominence certain sociological theories is perhaps visible. Thus, the doctrine of primitive communal marriage is evidently one he holds in high esteem, and seeks to support by all the evidence possible. Much that he adduces to this effect would bear another interpretation. The observations (pp. 69, 70, and elsewhere) on the strange relations which have ever existed between the sexual passions and the religious sentiments are very suggestive, and deserve further expansion and analysis.

Of these studies, that on the Kolarians of Bengal is perhaps the most vivid, and, though it is the last in the book, the reader may profitably begin with it, in order to learn promptly the style and resources of the author.

AMONG THE PUBLISHERS.

BULLETIN No. 73 of the North Carolina Agricultural Experiment Station is on agricultural grasses best adapted to North Carolina soil and climate.

— A novelty in periodical literature is the *Kings' Jester*, the first number of which has just appeared. It is devoted to the wit, humor, art, and advantages of advertising, and is published by Herbert Booth King & Brother, the well-known advertising agents of this city.

— Messrs. Macmillan & Co. announce as among their publications this summer a "Text-Book of the Developmental History of the Vertebrates," by Dr. Oscar Hertwig, professor of comparative anatomy in the University of Berlin, translated and edited by Dr. E. L. Mark, professor in Harvard University, fully illustrated; also a "Text-Book of the Developmental History of the Invertebrates," by Drs. Korschelt and Heider of Berlin, translated under the supervision of Dr. E. L. Mark of Harvard, fully illustrated.

— Darwin's book on "The Structure and Distribution of Coral Reefs" has been issued as one of the Camelot Series by Walter Scott of London, the New York publishers being A. Lovell & Co. The edition includes an introduction by Joseph W. Williams. As the price is low and the volume attractively made up, the book is worth examining by those interested.

— Part II. of Whiting's "Short Course of Experiments in Physical Measurements" has just been issued, and covers measurements in sound, dynamics, magnetism, and electricity. Mr.

Whiting was for some years connected with the Jefferson Physical Laboratory of Harvard College, and this work embodies the results of his experience in teaching physical measurements to the Harvard students.

—In "Domestic Science," by James E. Talmage, Ph.D., published by the Juvenile Instructor Office, Salt Lake City, Utah, the author has attempted to bring together in a simple manner such topics as have a direct bearing upon the science of domestic operations. His object has been to direct attention to daily household affairs, and we think he has treated his subject with fair success.

—Messrs. Ginn & Co. announce to be published in the summer of 1891, "The Prometheus Bound of Æschylus, with the Fragments of the Prometheus Loosed," with introduction and notes by N. Wecklein, rector of the Maximilian Gymnasium in Munich, translated by F. D. Allen. The book is a translation, with some freedom as to form of expression, of Wecklein's second edition (1878). A few changes in text and commentary have been requested by the German editor, and references to American grammatical works have been added by the translator. The copious explanatory commentary is followed by a critical appendix.

—Messrs. Ginn & Co. have published a small volume entitled "A Primer of Ethics," designed as an instruction-book and monitor for children. It is really a new edition of "The Rollo Code of Morals," published many years ago by Jacob Abbott; but the original work has been revised, with additions and omissions, by Benjamin B. Comegys. It treats of all those phases of morals which it is most important for young people to understand, and for the most part in a simple and attractive style. In a few passages the distinctions drawn are perhaps a little too fine for the learner's comprehension, and some of the definitions are hardly plain enough; but the great number of illustrative examples aid in making the subject clearer. In its new form the book deserves a new career of usefulness.

—Statements having been made in Paris affecting the authenticity of Marie Bashkirtseff's "Journal," says *The Publishers Weekly*, M. André Theuriet writes to the *Temps* that Marie's mother brought him the whole of the journal of her daughter, from 1873 to almost the eve of her death; and he undertook, too good-naturedly, to edit it, because implored to do so, and in memory of his dear friend Bastien Lepage. He consulted the Bashkirtseff family as to the cutting-out of oft-repeated passages, childish nonsense, tedious descriptions of toilets, and unpleasant reflections upon other persons. After this pruning, there was enough of the original matter to fill two volumes.

—In the fall of 1889, as stated in *The Publishers' Weekly*, the American Secular Union, a voluntary association having for its object the complete separation of Church and State, in practice as well as in profession, and in no way committed to any system of religious belief or disbelief, offered a premium of one thousand dollars for "the best essay, treatise, or manual adapted to aid and assist teachers in our free public schools and in the Girard College for orphans, and other public and charitable institutions professing to be unsectarian, to thoroughly instruct children and youth in the purest principles of morality without inculcating religious doctrines." The committee chosen to examine the numerous manuscripts submitted in competition included Richard B. Westbrook, LL.D., president of the Secular Union, Felix Adler of New York, and Dr. D. G. Brinton of Philadelphia. On its recommendation, the prize has been equally divided between the two manuscripts considered the best. The successful authors are Rev. N. P. Gilman of West Newton, editor of the *Literary World* of Boston, and Mr. Edward P. Jackson, one of the masters of the Boston Latin School.

—Herbert Spencer's views on state socialism are contained in an article entitled "From Freedom to Bondage," which will open the April *Popular Science Monthly*. This is probably the strongest refutation of socialistic theorizing that has yet appeared. The subject of street-cleaning in large cities will be treated in the

same number by Gen. Emmons Clark of New York. The article will include explicit practical suggestions for the proper performance of this important work. The battle between Professor Huxley and the defenders of theology is still going on. There will also be an essay by the Duke of Argyll, entitled "Professor Huxley on the War-Path," in which the professor is charged with treating theological questions inconsistently with his treatment of scientific subjects. "What keeps the bicyclist upright?"—a question that is often asked—will be answered in an illustrated article by Charles B. Warring.

—Messrs. F. Warne & Co., New York, inform us that they will shortly issue the English edition of Major Casati's work, which will be published in two volumes, containing nearly two hundred original illustrations and several valuable maps. The period embraced by the work extends from a date prior to Gen. Gordon's appointment as governor-general of the Soudan to the return of Mr. Stanley's expedition. Major Casati, who was resident among the native tribes south of Khartoum and in various parts of Central Africa during the rise of Mahdism, gives valuable information as to the political situations there during the early stages of the revolution, and a most interesting account of the fall of Khartoum and the death of Gordon. Of the ten years of his stay in the Equatorial Provinces, he passed a series of years with Emin Pacha, whose full confidence he enjoyed; and, being the only European officer present during the latter years of Emin's governorship, he had exceptional opportunities for gaining information and forming an independent judgment on the political and other mysterious questions in connection with these provinces.

—G. P. Putnam's Sons will publish at once, in their series of Questions of the Day, "The Question of Copyright," a volume comprising the following material: (1) the text of the new copyright law of Feb. 4, 1891, which, under reciprocity arrangements, secures American copyright for aliens, and foreign copyright for Americans; (2) the text of the copyright law of July 8, 1870, now superseded; (3) the present copyright law of Great Britain; (4) the amended copyright law as recommended by the British Parliamentary Commission of 1879; (5) the amended copyright law as recommended by the British Society of Authors in 1891; (6) an analysis of the Royalty Scheme of Copyright (recommended by Mr. R. Pearsall Smith, Sir T. H. Farrer, and others); (7) the International Copyright Convention as ratified at the Berne Conference, Sept. 5, 1887; (8) report of the International Copyright Convention of South America, held at Montevideo, Jan. 11, 1889; (9) Henry Clay's report on copyright, domestic and international, Feb. 16, 1837; (10) "The Evolution of Copyright," by Brander Matthews; (11) "Literary Property," by G. H. Putnam; (12) "The Influence of International Copyright on the Price of Books," by Brander Matthews and G. H. Putnam; (13) "Copyright Monopolies, and Protection," by G. H. Putnam; (14) "The Nature and Origin of Copyright," by R. R. Bowker; (15) "Development of Statutory Copyright in England," by R. R. Bowker; (16) summary of copyright legislation in the United States; and (17) summary of the terms of copyright in the different countries of the world.

—In *Lippincott's Magazine* for April, "The Elizabethan Drama and the Victorian Novel," an article by T. D. Robb, institutes a comparison between the Elizabethan and the Victorian views of life and art. In "Yarns about Diamonds," in the same magazine, David Graham Adey relates some interesting facts about diamonds in general, and tells many stories relating to the discovery and history of some of the most famous of these gems, such as the Great Mogul, the "Braganza," the "Regent," the "Crown of the Moon," the "Star of South Africa," and many others; and Charles Morris, in an article entitled "New Africa," tells how nearly the whole African continent has been taken up by European nations.

—In *The Chautauquan* for April we note "The Intellectual Development of the English People," by Edward A. Freeman; "Life in Modern England," I., by J. Ranken Towse; "British America," by Professor A. P. Coleman; "The Referendum in Switzerland," by J. W. Sullivan; "Studies in Astronomy," VII., by Garrett P. Serviss; "Dreaming," by Flavel Scott Mines;

"What the World owes to the Arts of Persia," by S. G. W. Benjamin; "The Written Examination and Good Literature," by Mary E. Burt; "Woman as Scholar," by Katharine Lee Bates; "How to make a Wild Garden," by Mary Treat; "Woman's World in London," by Elizabeth Robbins Pennell; and "How Marriage affects a Woman's Wages or Business," by Lelia Robinson Sawtelle.

—In the first of the steamship articles in the April *Scribner*, John H. Gould says, "From the records kept in the Barge Office in New York City, it appears that ocean travel varies according to the business situation in this country. Following is an exhibit of the number of cabin passengers that arrived at this port during the years between 1881 and 1890, inclusive: 1881, 51,229; 1882, 57,947; 1883, 53,596; 1884, 59,503; 1885, 55,160; 1886, 68,742; 1887, 78,792; 1888, 86,302; 1889, 96,636; 1890, 99,189. From one point of view, at least, these figures are very striking. In 1889 there was a great show in Paris that attracted world-wide attention and interest. In the spring of that year every steamship agent announced to prospective passengers that all vessels would be crowded, and that the volume of passenger traffic between the continents would swamp the capacity of every line. But the figures speak for themselves. Viewing the increase of oceanic travel, it appears that the financial depression of 1884 kept many people at home who otherwise might have crossed the ocean. After that distressing season had passed, travel resumed its nor-

mal condition, and an increase may be noted with each year." Birge Harrison (the American artist, now in Australia) describes a kangaroo-hunt in the same issue. This curious animal has been practically exterminated in the older parts of Australia. The author says, "In some parts of Victoria they formerly outnumbered the sheep as two to one; and old shepherds have told me that it was not an uncommon thing to see the sheep and the kangaroos feeding together upon the plains, as many as two or three thousand kangaroos frequently accompanying a flock of a thousand sheep. Thus it will be seen that a 'station' which, in 1850, could barely graze five thousand sheep, can now be made to carry forty thousand without any danger of overstocking." Professor Thomas Dwight of the Harvard Medical School discusses "What is Right-handedness?" Rev. Willard Parsons, manager of the *Tribune* Fresh-Air Fund, tells the story of its growth and work for fourteen years. From the diaries of Capt. Stockton, United States Navy, and from conversations with him, Robert Gordon Butler tells the story of the remarkable Arctic cruise of the United States steamer "Thetis" in 1889, when she was sent to relieve any vessels of the North Pacific whaling-fleet in distress, to rescue shipwrecked sailors, and to erect a house of refuge at Point Barrow, the northernmost point of Alaska.

—"Lessons in Applied Mechanics," by James H. Cotterill, F.R.S., and John Henry Slade, R.N., just published by Macmillan & Co., consists in great measure of selections from the matter

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contained in "Applied Mechanics," a larger treatise on the same subject, by Professor Cotterill of the Royal Naval College, Greenwich. It may therefore be described as an abridged edition of the previous work. The abridgment, however, has been completely re-arranged and re-written in fuller detail where necessary for the purpose of the work: consequently it may be considered as virtually a new book, smaller in compass and more elementary in character than the larger treatise upon which it was modelled, and to which it may serve as an introduction. To junior students of engineering, and others beginning the study of the subject, the book will prove valuable, as the plan of arrangement and method of treatment admirably adapt it to their requirements.

— Messrs. Ginn & Co. announce "Essential Uses of the Moods," by Robert P. Keep, principal Free Academy, Norwich, Conn., revised by John C. Rolfe, professor of Latin, Michigan University. The object of this pamphlet is to present in simple language the correspondences and differences in the uses of the moods in Greek

and Latin. The pamphlet was first issued in 1879. A second edition was called for in 1882. From that time there was a steady sale for the little work until two years since, when the plates were melted in a fire. Other occupations of the author have delayed the preparation of a new edition until now. The delay has been in the end no disadvantage, for the pamphlet has been in various ways improved. Among the additions may be mentioned full references to the Latin and Greek grammars in most common use. These references are placed in the margins, and will bring the pamphlet into clear relation to the grammars which the pupil has used in his previous study.

— The April number of the "Annals of the American Academy of Political and Social Science" will contain an economic article by Professor Tuttle of Amherst College on "The Concept of Wealth;" also an article by Mr. F. W. Holls of New York on "Compulsory Voting as a Means of reforming Political Abuses," and one by Dr. R. P. Falkner on "The Universities of Italy."

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